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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/543,138	07/22/2005	Thomas Bosselmann	2002P14382WOUS	4355

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Siemens Corporation  
Intellectual Property Department  
170 Wood Avenue South  
Iselin, NJ 08830

EXAMINER
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DUNLAP, JONATHAN M

ART UNIT	PAPER NUMBER
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2855

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/07/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/543,138

Applicant(s)

BOSELDMANN ET AL.

Examiner

Jonathan Dunlap

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on July 22, 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 18-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on July 22, 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

Continuation of Attachment(s) 3. Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :October 11, 2005/ July 22, 2005.

### **DETAILED ACTION**

**Claims 18-37** are pending in this application pursuant to a preliminary amendment filed on July 22, 2005. Claims 1-17 have been cancelled. The other amendments have been fully considered by the Examiner.

#### ***Priority***

Regarding application **10302714.9**

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Oath/Declaration***

Regarding application **10356513.2**

Receipt is acknowledged of papers filed under 35 U.S.C. 119 (a)-(d) based on an application filed in Germany on December 3, 2003. Applicant has not complied with the requirements of 37 CFR 1.63(c), since the oath, declaration or application data sheet does not acknowledge the filing of any foreign application. A new oath, declaration or application data sheet is required in the body of which the present application should be identified by application number and filing date. The foreign patent application is referenced but no claim to priority is indicated.

### ***Drawings***

**Figures 1 and 4-5** should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The disclosure is objected to because of the following informalities:

- **Page 1, [0001]** – A claim to foreign priority over application 10356513.2 has not been claimed in the accompanying oath/declaration.

- **Page 1, [0003]** – The summary of the invention heading appears twice as per the preliminary amendment. In the amended specification, Applicant has placed the summary of invention as a heading to [0009] but neglected to remove it and the following paragraph [0003].
- **Pages 5 and 7, [0018] and [0026]** – Applicant has stated, “In additional provision.” This grammatical error should be corrected to either “**An** additional provision” or “In addition, **a**”.
- **Page 11, [0044]** – Applicant has stated, “the antenna 8 and co the speed.” Perhaps Applicant meant “and **C<sub>o</sub>**” which would reference the preceding equation.
- **Page 13, [0047]** – Applicant has stated, “exclusively intended for „listening”. Perhaps Applicant meant “listening”.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

**Claims 18-29** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The method of determining stress of at least one turbine component does not produce a tangible result. The practical application of the claimed invention cannot be realized until the information is conveyed to the user. For the results to be tangible, it would need to output the information to a user, display it

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for a user, stored for later use, or used in a tangible manner. Merely determining, selecting, calculating, evaluating and acquiring would not appear to be sufficient to constitute a tangible result, since the outcome of the method has not been used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized.

The claimed invention as a whole must be useful and accomplish a practical application. That is, it must produce a "useful, concrete and tangible result." State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02. The purpose of this requirement is to limit patent protection to inventions that possess a certain level of "real world" value, as opposed to subject matter that represents nothing more than an idea or concept, or is simply a starting point for future investigation or research (Brenner v. Manson, 383 U.S. 519, 528-36, 148 USPQ 689, 693-96 (1966)); In re Fisher, 421 F.3d 1365, 76 USPQ2d 1225 (Fed. Cir. 2005); In re Ziegler, 992 F.2d 1197, 1200-03, 26 USPQ2d 1600, 1603-06 (Fed. Cir. 1993)).

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claim 18** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 18** as written is will be rejected under 35 U.S.C. 112 and 35 U.S.C. 101 because a single claim, which claims both an apparatus and the method steps of using the apparatus, is indefinite under USC 112, second paragraph. This type of claim is indefinite because it fails to positively recite the boundaries of protection. The metes and bounds of the claim cannot be determined because it is unclear whether protection is sought for the method or for the apparatus.

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**MPEP 2173.05 (p) (II) States:**

**PRODUCT AND PROCESS IN THE SAME CLAIM**

A single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 U.S.C. 112, second paragraph. \* > IPXL Holdings v. Amazon.com, Inc., 430 F.2d 1377, 1384, 77 USPQ2d 1140, 1145 (Fed. Cir. 2005); < Ex parte Lyell, 17 USPQ2d 1548 (Bd. Pat. App. & Inter. 1990) \* > (< claim directed to an automatic transmission workstand and the method \* of using it \* held \*\* ambiguous and properly rejected under 35 U.S.C. 112, second paragraph > ) < .

Such claims \* > may < also be rejected under 35 U.S.C. 101 based on the theory that the claim is directed to neither a "process" nor a "machine," but rather embraces or overlaps two different statutory classes of invention set forth in 35 U.S.C. 101 which is drafted so as to set forth the statutory classes of invention in the alternative only. Id. at 1551.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 18, 23-24, 28-33, 35 and 37** are rejected under 35 U.S.C. 102(b) as being anticipated by **Twerdochlib et al. (U.S. Patent 5,479,826)**.

Considering **claims 18, 30 and 37**, Twerdochlib discloses a turbine machine **2** having a method, according to **claim 18**, and a device, according to **claims 30 and 37**, for determining stress of at least one turbine component **8** of a plurality of turbine components of the turbine machine the device comprising: **(Figure 1; Column 2, lines 15-25)**

- A turbine component **8** chosen from the group consisting of a turbine blade and a guide vane **(Figure 4a; Column 4, lines 15-18)**;



- The plurality of turbine components arranged in component rows  
**(Figure 1; Column 3, lines 19-24);**
- At least one electromagnetic wave emitter **42** for emitting at least one electromagnetic emission wave **(Figure 4a; Column 4, line 12);**
- At least one electromagnetic wave receiver **50** for receiving at least one electromagnetic receive wave **(Figure 5a; Column 4, line 47);**
- At least one analyzer for analyzing the electromagnetic receive wave, the turbine component **8** comprising a reflection surface for converting the electromagnetic emission wave into the electromagnetic receive wave by at least partially reflecting the electromagnetic emission wave **(Figure 5a; Column 5, lines 2-10; Column 4; lines 46-62);**
- The electromagnetic wave emitter **42** and the electromagnetic wave receiver **50** sized and configured to be arranged and arranged at at least one location between the component rows and operatively connected to the reflection surface of the turbine component **(Figures 1-2; Column 2, lines 15-49);**

The method comprising:

- Emitting the electromagnetic emission wave by the electromagnetic wave emitter **(Column 4, lines 13-15);**
- Converting the electromagnetic emission wave into the electromagnetic receive wave by the reflection surface of the component **(Figures 5a-5b; Column 4, lines 49-55);**

- Receiving the electromagnetic receive wave by the electromagnetic wave receiver (**Figures 5a-5b; Column 4, lines 49-55**); and
- Determining the stress of the component by analyzing the received electromagnetic receive wave by the analyzer (**Column 1, lines 10-24, lines 35-51; Column 5, lines 2-25**).

Considering **claim 23**, Twerdochlib discloses that analyzing the received electromagnetic wave comprises an evaluation of a vibration status of the reflection surface used for determining the stress (**Column 1, lines 10-24, lines 35-51; Column 5, lines 2-25**).

Considering **claim 24**, Twerdochlib discloses that the electromagnetic emission wave comprises at least one electromagnetic emission wave having a wavelength based on a surface shape of the reflection surface (**Column 5, lines 37-45**).

Considering **claim 28**, Twerdochlib discloses that determining the stress of the turbine component is executed while an operation of the turbine machine (**Column 3, lines 29-31**).

Considering **claim 29**, Twerdochlib discloses that the electromagnetic emission wave is a radar wave (**Column 2, lines 7-12; Column 4, lines 10-15; Column 5, lines 33-45**).

Considering **claim 31**, Twerdochlib discloses that the electromagnetic wave emitter and the electromagnetic wave receiver are operatively connected to the reflection surface such that by emitting the electromagnetic emission wave converting the electromagnetic emission wave into the electromagnetic receive wave and receiving

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the electromagnetic receive wave occur (**Figures 5a-5b; Column 1, lines 10-24, lines 35-51; Column 4, lines 13-15, lines 49-55; Column 5, lines 2-25**).

Considering **claim 32**, Twerdochlib discloses a housing with a turbine channel in which the component rows are arranged (**Column 2, lines 15-25**).

Considering **claim 33**, Twerdochlib discloses that the electromagnetic wave emitter comprises an electric vibration generator for generating an electric vibration and a transformer for transforming the electric vibration into the electromagnetic emission wave (**Figure 4a; Column 4, lines 10-16**).

Considering **claim 35**, Twerdochlib discloses a radar antenna included in the electronic wave emitter or in the electronic wave receiver (**Figure 4a; Column 4, lines 10-16**).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 19-22 and 36** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Twerdochlib et al. (U.S. Patent 5,479,826)** in view of **Harrold et al. (U.S. Patent 6,512,379)**

The invention by Twerdochlib discloses all of the claimed limitations from above but fails to disclose a method that is executed on both a blade and a guide vane,

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surface quality that is based on intensity of a received signal and that the turbine is a gas turbine. However, regarding **claim 21** in view of Harrold, Twerdochlib also discloses emitting the electromagnetic emission wave comprises at least one electromagnetic emission wave having a wavelength based on a shape of the reflection surface (**Twerdochlib, Column 5, lines 37-45**).

7. However, Harrold teaches:

Considering **claim 19**, that the method is executed to determine the stress of both a turbine blade and a guide vane (**Column 6, lines 34-47**).

Considering **claim 20**, that analyzing the received electromagnetic wave comprises an evaluation of a surface quality of the reflection surface used for determining the stress.

Considering **claim 22**, that the evaluation of the surface quality comprises detecting an intensity of the electromagnetic receive wave (**Column 2, lines 45-52; Column 5, lines 8-15, lines 49-65**).

Considering **claim 36**, that the turbine machine is a gas turbine (**Abstract**).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to determine the stress on either a guide vane or a turbine blade and evaluate the surface quality as taught by Harrold in the invention by Twerdochlib. The motivation for doing this is to monitor the condition of turbine components while the turbine is in use which avoids the necessity to periodically stop

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the turbine for inspection, reducing downtime, increasing the turbine's efficiency

**(Column 1, lines 33-44)**

8. **Claims 25 and 34** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Twerdochlib et al. (U.S. Patent 5,479,826)** in view of **Harrold et al. (U.S. Patent 6,512,379)** and further in view of **Gray (U.S. Patent 4,131,889)**.

The invention by Twerdochlib, as modified by Harrold, discloses all of the claimed inventions from above but fails to disclose that the frequency of the emission wave is compared to the frequency of the receive wave and that the emitter and receiver form one integrated unit.

9. However, Gray teaches:

Considering **claim 25**, that the evaluation of the vibration status comprises comparing a frequency of the electromagnetic emission wave and to a frequency of the electromagnetic receive wave (**Column 1, lines 10-26; Column 2, lines 25-44; Column 3, lines 3-9, lines 36-45**).

Considering **claim 34**, that the electromagnetic wave emitter and the electromagnetic wave receiver form one integrated unit (**Column 2, lines 59-66**).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to evaluate a vibrational status by comparing an emitted wave to a received wave, wherein the emitter and received form one integrated unit as taught by Gray in the invention by Twerdochlib, as modified by Harrold. The motivation for doing

so is found in the disclosure by Gray in that Gray teaches that the use of Doppler radar systems as diagnostic systems for turbine blades.

10. **Claims 26-27** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Twerdochlib et al. (U.S. Patent 5,479,826)** in view of **Gray (U.S. Patent 4,131,889)** and further in further view of **Leon (U.S. Patent 4,422,333)**.

The invention by Twedochlib, as further modified by Gray, discloses all of the claimed limitations from above but fails to disclose that the vibrational and surface quality analyses are performed simultaneously during the analysis of the received electromagnetic wave.

11. However, Leon teaches:

Considering **claim 26**, that analyzing the received electromagnetic wave comprising an evaluation of a surface quality of the reflection surface and an evaluation of a vibration status of the reflection surface, wherein the surface quality and the vibrational status are used for determining the stress

Considering **claim 27**, that the evaluation of the surface quality and the evaluation of the vibrational status are executed simultaneously (**Column 2, lines 15-32; Column 4, lines 50-55; Column 8, lines 54-68; Column 9, lines 1-2**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate analyzing surface quality at the same time as analysis of the vibrational status of the turbine component as taught by Leon in the invention by Twerdochlib, as further modified by Gray. The motivation for doing so is

found in the disclosure by Leon in that Leon teaches the use of frequency and amplitude monitoring to determine vibrational status and surface quality being used to determine the stress on a turbine blade (**Column 2, lines 14-33**).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Kauppila discloses a vibration monitoring system that collects a vibrational spectrum from a turbine machine to monitor parts before they break down.
- Shvetsky discloses a turbine monitoring system that transmits and receives an ultrasonic pulse towards and from rotating turbine blades at a frequency substantially related to the frequency of rotation of the turbine, wherein the reflected echos are used to determine cracking or flaws.
- Bannister et al. discloses a turbine blade vibration detection apparatus having multiple radar sensors positioned towards blade rows, wherein a shroud may surround the blades.

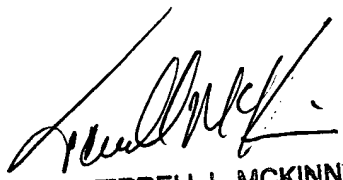
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Dunlap whose telephone number is (571) 270-1335. The examiner can normally be reached on M-F 8-5 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrell McKinnon can be reached on (571) 272-4797. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



TERRELL L. MCKINNON  
SUPERVISORY PATENT EXAMINER

Jonathan Dunlap  
Examiner  
Art Unit 2809  
January 29, 2007

